the species are to receive different names," as the writer of the paper remarks, for by a strange slip of memory the volume is said to enumerate "less than 400 monopetalous [sic] species from Caprifoliaceæ to Compositæ inclusive." The Compositæ alone include nearly four times that number!

ENTOMOLOGY.

GREAT SWARMS OF A PSEUDO-NEUROPTEROUS INSECT IN JAPAN.—On the 17th February of this year (1878), at about 7 o'clock A.M., this curious kind of insect (in the bottle) was seen at Yunosawa, in the district of Kameda, near Hakodate port, flying in swarms of so great numbers that for the distance of about four or five chios (1440 to 1800 feet) it seemed quite dark. At this time they were very small and looked like gnats or mosquitos. But about one hour afterwards they seemed to grow as big as a small sort of fly, and each pair copulated together for several hours, and then they all fell down dead.

This insect was also seen on the 29th December last year (1877). The residents of that place stated that they had never seen any before there, even in summer, and they considered it very strange that such insects were found there in the season of snow, especially during this severe winter.

Yunosawa is situated in a small valley. A small stream runs through this valley, and at its bank there is a lime manufactory, besides only one farmer's house, and a few rice fields, also a hot spring in this valley.

I have the honor to request you will be kind enough to examine the accompanying specimens of some curious insects lately found at Yunosawa, and shall be glad if you can give me some information regarding them.—*Aritake Yutaka, Kaitaku Wosakwau.*

[The insects were sent to Dr. Hagen who pronounced them a species of Capnia.—*Ed.*]

THE LARVAL STAGES OF MAMESTRA PICTA.—In the middle of September, 1876, the caterpillars of this moth did extensive injury to the ruta bagas on the farm of the Massachusetts Agricultural College at Amherst; eight years previous they also destroyed the leaves of this vegetable as well as the beet. The following descriptions may be of service as data for a comparative study of the early stages of the Noctuidæ:

Larva before the 1st moult.—Length $4^{mm.}$ Head as wide as the body, pale-greenish; body pale-greenish with a double dark livid dorsal stripe divided by a pale median line; three lateral dark stripes, of which the uppermost is the narrower; five pairs of abdominal feet, first pair one-half the size of the fourth pair. Body well tuberculated, being smoother in the adult.

Larva after the 1st moult.—Length $7^{mm.}$ Markings much as in the full-grown larva, deep yellow with a broad black dorsal band,

sometimes entire and sometimes divided by a median pale line. A lateral area marbled with transverse short black and white lines, and with a row of conspicuous black spots. A row of dark spots down on the sides. Head reddish testaceous; abdominal feet reddish.

Larva after 2d or 3d moult.—Length 25$^{mm.}$ Markings as in the full-grown caterpillar, straw-yellow, with a broad dorsal black stripe, and a broader dark lateral stripe; this stripe interrupted by transverse rune-like white markings breaking up the band into similar black runes.

A caterpillar moulted under my eyes; the sides of the head fell off away from the rest of the body, and in an instant the anterior half of the body was pulled out of the old skin; I do not understand where it went to; then in a minute more, stopping occasionally to rest, it withdrew itself from the remainder of its old skin, holding on by its hind legs until they were extricated from the cast skin. The whole process was but the work of one minute. It was but little larger than previous; the prothoracic segment was less spotted and the head much paler than before. By 4 P. M., or about four or five hours after, the head was red-colored, and the six prothoracic black spots had appeared.—*A. S. Packard.*

THE BEES, WASPS, ETC., OF LABRADOR.—Several years ago I named the bees and a few other Hymenoptera which I collected in Labrador during the summers of 1860 and 1864. The specimens are now in the Museum of the Peabody Academy of Science, at Salem, Mass. Of the species of Bombus by far the most common species was *B. lacustris* Cresson, which occurred at Henley harbor, Square island, Sloop harbor and Strawberry harbor; *B. nivalis* Dahlb? occurred at Caribou island, Straits of Belle Isle; *B. frigidus* Smith, occurred at Square island and Hopedale; it also was brought from Nulato, Alaska, by Mr. W. H. Dall; *B. kirbyellus* Curtis, an arctic species, occurred at Sloop harbor and Hopedale. Of the genus Vespa, *V. maculata* flew aboard our vessel at Little Mecatina island, while a nest of *V. norvegica* Fabr. occurred under the turf at Caribou island; it is identical with specimens from Alaska (Dall). *Formica herculanea* was common on the Labrador coast, and is also frequent in northern Alaska. Two species of Sirex occur; besides a common one at Caribou island, a bluish-green species occurs at Hopedale; the stout spine is concolorous with the body, while the legs are yellowish.—*A. S. Packard.*

DANGERS FROM THE EXCREMENT OF FLIES.—The Journal of the Royal Microscopical Society for August, prints an abstract of B. Grassi's experiments which show that flies are agents in the diffusion of infectious maladies, epidemics, and even parasitic diseases.

On a plate on the table of his laboratory he placed a large number of the eggs of a human Nematode parasite (Trichocephalus).

After a few hours, he found, on some white sheets of paper hanging in the kitchen, the well-known spots produced by the excreta of the flies, and on a microscopical examination of these spots, several of the eggs of the parasite were found in them. Some flies coming into the kitchen were now caught, and their intestinal tract was found quite filled with an enormous mass of fæcal matter, in which the presence of eggs of Trichocephali were detected. As it was practically impossible to keep all alimentary substances from contact with these flies, it follows that the chances of Dr. Grassi and his family being infected with Trichocephali were very great. As a matter of fact, the experiment was tried with non-segmented eggs of this worm. Another experiment was in the same direction. Dr. Grassi took the ripe segments of a *Tænia solium* (which had been in spirits of wine), and broke them up in water, so that a great number of the tapeworm's eggs remained suspended in the fluid. The flies came to the mixture, attracted by the sugar, and in about half an hour the ova of the tapeworms were to be found in their intestines and in the spots. Had these eggs been in a recent and living state, they would doubtless have been just as easily transported. To those who care to try these experiments, it is suggested that lycopod powder, mixed with sugar and water, is a good material, as the lycopod spores are easily detected.

It is self-evident that if the mouth-apparatus of the fly will admit of the introduction of such objects as have been above noted, that there will be no difficulty in its admitting scores of the spores of many parasitic fungi, and above all of those belonging to the Schizomycetes, the possible cause of so much disease. Already Dr. Grassi has detected in fly excrement the spores of *Oidium lactis*, and the spores of a Botrytis, this latter taken from the bodies of silkworms dead of muscardine.

There arises, of course, the question of how far the active digestion of the intestines of the fly may not destroy the vitality of germs or spores thus taken in, but it would seem probable that in many instances the larger bodies swallowed may not serve as objects for assimilation, but may be got rid of as foreign bodies, and it will be borne in mind that the flies themselves fall victims to the growth of a parasitic fungus (*Empusa muscæ* Cohn), which is probably taken first into their own stomachs.

Origin of Bee's Cells.—Dr. Dönhoff urges objections to the views of Buffon, carried further by Müllenhoff, that bees' cells are due to pressure, pointing out that there is no relation between the forms of the cells and of the bees' bodies, and that he has observed a single female build a nest consisting of a number of six-sided cells; further, the difference seen in cells formed by bees and drones cannot be correlated with any differences to be found in the inhabitants; in the formation of the queens' cells by

other bees there is no pressure to produce the rhomboid pits; direct observation of the formation of a comb was not rewarded by any indications of pressure; no reasonable amount of pressure on the walls of cells seems to have any effect in altering their form.

The author thinks that Darwin has erred in supposing that the cells have at first the forms which they have later on, whereas this is by no means the case; at first there are nothing but rhomb-shaped spaces, the size of which is gradually increased. Compare also the statements made by Packard in "Guide to the Study of Insects," pp. 121–122, as to the way in which Polistes begins its cells.

ENTOMOLOGICAL NOTES.—The Bulletin of the Brooklyn Entomological Society for October republishes Herrich-Schæffer's synopsis of the "families" of Lepidoptera, with the statement that the table "is not exactly accurate, as applied to our fauna, but it is so far correct that all save a few aberrant forms can be correctly referred by its means." It seems to us a great pity to reproduce an antiquated, in many respects artificial and misleading classification of the Lepidoptera, which may have been useful in Europe, but is not now provocative of good work in America. ——The same journal contains a report of the proceedings of the Entomological Club of the American Association Adv. Science, Philadelphia meeting. Dr. D. S. Kellicott read a paper on the ovipositing apparatus of *Nonagria subcarnea*. Mr. Mann, one of the chief editors of *Psyche*, proposed a combination of the entomological journals of America, a view we heartily advocate. A committee appointed to consider whether such a combination was advisable, reported adversely to any such scheme. We do not see why a well-conducted, responsible journal, well edited, free from crotchets, with articles and departments representing anatomical, systematic, biological and economic entomology, would not meet with support. Meanwhile it is comforting to learn that the American Entomological Society is "wealthy enough to publish everything in the way of long systematic papers presented to it, and the transactions would be the natural avenue for such works." We desire to add that the proceedings and transactions of this society have always been up to high-water mark; if we had no other periodicals, the transactions would worthily represent American entomological science.—— The discussion regarding nomenclature introduced by Professor Fernald was noteworthy in some points. In the course of it, Professor Fernald expressed surprise that Hübner's Verzeichniss genera should be so generally ignored, though his genera were after a fashion described; Mr. Smith stating that Hübner's genera of Noctuidæ would not hold, Professor Fernald added that in the Tortricidæ "Guenee has just as many baseless genera as Hübner has." Mr. Smith discussed the secondary sexual character

of the Noctuidæ and Deltoidæ. Mr. Mann explained how Professor Barnard raised larvæ living in running water. He confined them in a glass tube, one end closed by a porous substance, the other fastened to a faucet. In this way a steady flow of water of any desired strength can be kept up. Dr. Horn stated that, in 1874, when working with Dr. Le Conte on the Rhynchophora, among all their material only a single specimen of *Aramiges fulleri* was contained, and that came from Montana. A year or two after, it was received from all parts of the country, and was dreaded as one of the worst hot-house pests. How did this species spread so suddenly over so large a territory? Professor Lintner had first found the insect in 1876. Professor Dimmock found it very troublesome in hot-houses, especially on roses.——The composition and properties of the light emitted by insects of the genus Pyrophorus forms the subject of a paper recently presented to the Paris Academy of Sciences by MM. Aubert and R. Dubois. The spectrum of the light, examined by the spectroscope, is very beautiful, but destitute of dark bands. When, however, the intensity diminishes, the red and orange disappear, and the green and yellow only remain.——The investigations of M. Carlet enable him to affirm that the poison-apparatus of the Hymenoptera is always composed of two distinct glandular systems, the one with a strongly acid, the other with a feebly alkaline secretion. These two systems unite at the sheath of the sting. The resultant venom is always acid. The action of this venom upon some animals, as rabbits, frogs and certain beetles, is slight, but the domestic fly and the flesh fly are killed immediately by it. The inoculation of a fly with the secretion of one of the glands does not produce death until after a considerable time, but death follows very quickly if the same fly is subjected to a second inoculation, this time with the secretion of the other gland.——M. J. Chatin has studied the basilar piece of the jaw of insects, a part which has been much neglected, yet one of considerable importance. In *Blaps producta*, this portion, which M. Chatin calls the submaxillary, is produced beyond the maxillary.——P. Kirbach (Archiv für Naturgeschichte) gives a description of the structure of the parts of the mouth in the Lepidoptera.——A correspondent writes us as follows: Cape San Antonio is the westernmost point of the island of Cuba. During the whole of the night of the 23d of August, 1884, the lantern of the light-house at that place was surrounded by a cloud of winged insects almost entirely of a bright-red hue, the presence of these causing the light to assume a decided red color; the wind was moderate and from the south-west; the sky was overcast. A few of these bugs have been sent to this city (New York) by Francisco Bautista, the keeper of the light, and identified as cotton-stainers (*Dysdercus sanguinarius* Stal). Though other similar insects have been observed to fly toward lights, this is the first time that

this one has been so reported. It is to be hoped that such dangerous action will not prove chronic with the brilliant and beautiful Hemiptera.——Professor C. V. Riley was awarded a gold medal by the Forestry Exhibition at Edinburgh, in October, for the collection of insects injuring forest trees sent out by the Entomological Division of the Department of Agriculture.

ZOÖLOGY.

THE MOLLUSCAN BODY-CAVITY.—The molluscan forms in general are unlike most of the other metazoan groups in having or seeming to have no body-cavity, the spaces between their organs being filled up with branched cells forming a parenchymatous mass. This fact has led the Hertwig brothers to subdivide the Metazoa above Cœlenterates into two groups, animals with a true body-cavity lined with epithelial cells, including annelids, arthropods and vertebrates, and animals with no such cavity, but with a pseudo-body-cavity of lacunar spaces among amœboid-shaped cells, including Polyzoa, rotifers, plathelminths and Mollusca. Zoölogists generally have been disinclined to accept the view that the parenchymatous tissues of the mollusk are at all comparable with the body-cavity of annelids, etc., and prefer to consider these body-spaces of the mollusks a vastly increased mesodermal mass that has encroached upon the true epithelial-lined body-cavity and greatly reduced its proportions.

It is a constant feature of true body-cavities that they stand in direct communication with the exterior through organs usually excretory in function but also often reproductive. In the Mollusca the pericardium is in direct communication with the exterior through the organ of Bojanus, the molluscan kidney. This has been observed and described in a very large number of Lamellibranchs. Cunningham has recently shown that the kidney in Aplysia[1] and in Patella[2] has openings into the pericardium. Sedgwick has shown the same for Chiton. It has, therefore, been suggested on many sides that in the molluscan pericardium we have the remains of a body-cavity, but shrunken here to very small dimensions. Upon this view the very characteristic form of the molluscan kidney and pericardium becomes intelligible.

In a paper by Von Ihring[3] we are informed that there is a further relation between the renal organs and the generative system which is of interest. We are taught that in the mollusks the genital organs are shut off from the renal system, and open to the exterior by a special duct directly continuous with the organ. This is very unlike the animals with a body-cavity, for in them the genital organs very generally are related to the body-cavity

[1] *Mitt. Zool. Stat. Neapel*, Vol. IV, p. 420.

[2] *Quart. Jour. Mic. Sci.*, July, 1883,

[3] *Zeitschr. f. w. Zool.*, XXIX, p. 583.